

CLAIMS

1. An ion mobility spectrometer system including a first and second IMS cell (1 and 2), each cell having an inlet (3) by which a vapour or gas to be analysed is supplied to the cells, a driver (12) operable to drive the first and second cells (1 and 2) at opposite polarities such that the first and second cells are responsive to respective first and second substances different from one another, characterised in that the driver (12) is operable to switch the polarity of at least the first cell (1) so that it is responsive to a substance different from the first substance.
2. A spectrometer system according to Claim 1, characterised in that the driver (12) is operable to switch both the first and second cells (1 and 2) so that at any one time one cell is operating at positive polarity and the other is operating at negative polarity.
3. A spectrometer system according to Claim 1 or 2, characterised in that the driver (12) is operable to switch polarity of the or each cell (1 and 2) at regular intervals.
4. A spectrometer system according to Claim 3, characterised in that the intervals are less than substantially 30 seconds.
5. A spectrometer system according to Claim 4, characterised in that the intervals are less than substantially one second.
6. A spectrometer system according to any one of the preceding claims, characterised in that the driver (12) is operable to switch polarity in response to a signal indicative of the presence of a substance.
7. A spectrometer system according to any one of the preceding claims, characterised in that the system is arranged to supply reagents to the cells (1 and 2) to promote detection of the substances.

8. A spectrometer system according to Claim 7, characterised in that both cells (1 and 2) are supplied with a first reagent for promoting detection of a substance in the positive mode and a second reagent for promoting detection of a different substance in the negative mode.
9. A spectrometer system according to any one of the preceding claims, characterised in that the system is arranged to indicate a higher probability of the presence of a substance when it is detected in both the cells (1 and 2) than when it is detected in only one of the cells (1 or 2).
10. A spectrometer system according to any one of the preceding claims, characterised in that the driver (12) is operable initially to switch both the first and second cells (1 and 2) so that at any one time one cell is operating at positive polarity and the other is operating at negative polarity, and that, when a cell operating at one polarity indicates the presence of a substance, the driver (12) maintains that cell at that polarity.
11. A spectrometer system according to Claim 10, characterised in that, when a cell (1 or 2) operating at one polarity indicates the presence of a substance, the driver (12) maintains that cell at that polarity and switches the other cell to the same polarity.
12. A spectrometer system according to any one of the preceding claims, characterised in that the system includes an additional cell operated continuously at one polarity.